

ABSTRACT OF THE DISCLOSURE

5 An optical wave power control device and method enables signal control, such as modulation
transferring and switching, to be effected with the application of very low power to a controller
which is in optical communication with a recirculating mode resonator and an optical
propagation element. The propagation element is configured such that is in power
communication with a high Q volumetric resonator. Power of a chosen resonant wavelength is
10 coupled into said resonator, where it circulates with very low loss and returns energy to the
propagation element. By introducing a control signal into the controller, the propagated power
can be varied between substantially full and substantially zero amplitudes. Loss factors can be
maintained such that said resonator is overcoupled, i.e. parasitic losses are less than coupling
losses, and a critical coupling condition exists in which a small swing in the controller causes a
disproportionate change in the optical output signal. The controller is preferably effectuated by
15 an interferometer in the optical path of said resonator and a control signal, which can be an
applied voltage, current or optical signal.